DIRECT TESTIMONY OF
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ON BEHALF OF
THE SOUTHERN ENVIRONMENTAL LAW CENTER AND
THE SOUTH CAROLINA COASTAL CONSERVATION LEAGUE

DOCKET NO. 2009-261-E

1. INTRODUCTION

Q. Please state your name, employer, and present position.

A. My name is William Steinhurst, and I am a Senior Consultant with Synapse Energy Economics, Inc., ("Synapse"), which is headquartered in Cambridge, Massachusetts. My business address is 45 State Street, #394, Montpelier, Vermont 05602.

Q. On whose behalf are you testifying in this case?

A. I am testifying on behalf of the Southern Environmental Law Center ("SELC") and the South Carolina Coastal Conservation League ("SCCCL").

Q. Please describe Synapse Energy Economics.

A. Synapse is a research and consulting firm specializing in energy and environmental issues, including electric generation, transmission and distribution system reliability, ratemaking and rate design, electric industry restructuring and market power, electricity market prices, stranded costs, efficiency, renewable energy, environmental quality, and nuclear power.

Q. Please summarize your work experience and educational background.

A. I have over twenty-five years of experience in utility regulation and energy policy, including work on renewable portfolio standards and portfolio management practices for default service providers and regulated utilities, green marketing, distributed

resource issues, economic impact studies, and rate design. Prior to joining Synapse, I served as Planning Econometrician and Director for Regulated Utility Planning at the Vermont Department of Public Service, the State's Public Advocate and energy policy agency. I have provided consulting services for various clients, including the Connecticut Office of Consumer Counsel, the Illinois Citizens Utility Board, the California Division of Ratepayer Advocates, the D.C. and Maryland Offices of the Public Advocate, the Delaware Public Utilities Commission, the Regulatory Assistance Project, the National Association of Regulatory Utility Commissioners ("NARUC"), the National Regulatory Research Institute ("NRRI"), American Association of Retired Persons ("AARP"), The Utility Reform Network ("TURN"), the Union of Concerned Scientists, the Northern Forest Council, the Nova Scotia Utility and Review Board, the U.S. EPA, the Conservation Law Foundation, the Sierra Club, the Southern Alliance for Clean Energy, SELC, the Oklahoma Sustainability Network, the Natural Resources Defense Council ("NRDC"), Illinois Energy Office, the Massachusetts Executive Office of Energy Resources, the James River Corporation, and the Newfoundland Department of Natural Resources.

I hold a B.A. in Physics from Wesleyan University and an M.S. in Statistics and Ph.D. in Mechanical Engineering from the University of Vermont.

Q. Please summarize your expert witness experience.

A. I have testified as an expert witness in approximately 30 cases on topics including utility rates and ratemaking policy, prudence reviews, integrated resource planning, demand side management policy and program design, utility financings, regulatory

enforcement, green marketing, power purchases, statistical analysis, and decision analysis. I have been a frequent witness in legislative hearings and represented the State of Vermont, the Delaware Public Utilities Commission Staff, and several other groups in numerous collaborative settlement processes addressing energy efficiency, resource planning and distributed resources.

I was the lead author or co-author of Vermont's long-term energy plans for 1983, 1988, and 1991, as well as the 1998 report *Fueling Vermont's Future: Comprehensive Energy Plan and Greenhouse Gas Action Plan,* and also Synapse's study *Portfolio Management: How to Procure Electricity Resources to Provide Reliable, Low-Cost, and Efficient Electricity Services to All Retail Customers*. I was recently commissioned by the National Regulatory Research Institute to write *Electricity at a Glance*, a primer on the industry for new public utility commissioners, which included coverage of energy efficiency programs.

My resume is attached as Exhibit 1 to this testimony.

Q. Have you previously testified before the South Carolina Public Service Commission ("The Commission")?

A. No, I have not.

Q. What is the purpose of your testimony?

A. In this testimony, I discuss the mechanism proposed by South Carolina Electric & Gas ("SCE&G" or "the Company") for recovery of DSM program costs, lost revenue and incentives in this docket. I also address several related issues, including the need for exemplary program design and performance as a basis for such incentives and certain

high level principles of good energy efficiency program design and implementation that should be considered in setting incentives.

Q. What is your overall conclusion regarding the Company's proposal?

A. Overall, the Company's proposal represents a good start in some areas, but falls short in several others, as I discuss in detail below.

Q. **How is your testimony organized?**

A. I address the following issues:

- The benefits of energy efficiency programs and why they should be a policy priority for the Commission;
- The fact that energy efficiency programs have a solid record of successfully delivering cost-effective and dependable savings to utilities and ratepayers;
- Certain energy efficiency program design principles that should be followed to ensure exemplary programs and program performance; and
- Cost-recovery, lost margin and incentive mechanisms.

Q. As a preliminary matter, please explain your use in this testimony of the terms "energy efficiency," "demand response," and "energy conservation."

A. South Carolina law defines "demand-side activities" very broadly in S.C. Code 58-37-10(1) and includes within that definition both "energy efficiency" and "energy conservation," as well as "load management." I will refer to this broad trio of demand-side activities as **demand-side management** or DSM.[1]

[1] The statute also lists cogeneration and renewable energy technologies as possible forms of demand-side activity.

Electric energy efficiency programs are organized activities whose purpose is to change customers' electricity-using appliances, equipment, processes or structures so as to reduce the amount of end use electricity needed to provide the same level of energy services, such as heating, cooling, lighting, or traction.

Energy conservation programs are organized activities whose purpose is to reduce the amount of end use electricity demanded by customers by simply discouraging or making unnecessary the use of energy. One example of energy conservation is a customer lowering thermostat settings a few degrees in the winter from what had been the usual and raising them a few degrees in the summer. The customer conserves by demanding a less warm space in the winter and a hotter space in summer. This is in contrast to upgrading building insulation or HVAC equipment to use less energy while maintaining the same thermostat settings.

Load management programs, often referred to as "demand response programs," are measures or programs intended to reduce electric demand at the time of peak load or other times when electricity is especially expensive to produce or is in short supply. This may be done by curtailing customer usage at certain times and under certain conditions or by shifting that usage to off-peak hours.

When discussing DSM in this testimony, I will be mainly concerned with energy efficiency programs as defined above. Because utility programs around the country have repeatedly demonstrated the huge potential for customers to benefit from cost-effective

energy efficiency savings, I believe it would be most productive to focus on how best to enable vigorous and speedy acquisition of energy efficiency resources.[2]

2. DEMAND-SIDE MANAGEMENT PROGRAMS ARE HIGHLY BENEFICIAL AND SHOULD BE A POLICY PRIORITY FOR THE COMMISSION.

Q. Please summarize the benefits provided by demand-side management programs.

A. DSM programs should be pursued by the Commission as a top priority because demand-side resources are (1) less expensive, (2) less risky, and (3) better for the economy and job creation compared with new generation.

Q. How does the cost of DSM compare to the cost of new generation?

DSM is typically cheaper than new generation. For example, a recent study concluded that a package of energy efficiency policies, primarily utility DSM can help meet South Carolina's needs at a lower cost than building new generation and transmission, while creating close to 22,000 new, high-quality "green collar" jobs and saving South Carolinians $5.1 billion on their electricity and water bills by 2025.[3]

[2] I do not mean to diminish the potential value of energy conservation and load management. Energy conservation programs—activities designed to change residential or commercial arrangements, processes or structures so as to reduce the amount of end use service required as opposed to supplying the same amount of end use service more efficiently—can be socially valuable. Load management programs can significantly reduce the need for peaking generation and T&D facilities. The statute discussed above allows the Commission to consider or require utility programs to promote energy conservation and load response. However, while energy conservation and load response programs are valuable, the focus of this proceeding is the Company's proposed energy efficiency programs. Therefore, a discussion of energy conservation and load response programs is beyond the scope of this testimony.

[3] ACEEE, et al., *South Carolina's Energy Future: Minding Its Efficiency Resources*, November 2009, p. 82. Available at http://aceee.org. Note: Several Synapse staff members were a part of the team that produced this report, although I, myself, was not. Specifically, Synapse assisted ACEEE in the development of the avoided cost projections used in that report. I was not part of the Synapse team on that project and have no personal knowledge of the work done beyond what is in the published report.

The fact that is DSM is a better buy for ratepayers than expensive new generation is underscored by rapidly climbing construction costs for capital-intensive baseload plants in recent years.

For example, a report issued in June 2009 found that "significant cost increases have been announced for almost all other proposed coal-fired power plants in recent years," citing as examples the 80 percent increase in the estimated per-unit construction cost of Duke Energy Carolinas' Cliffside project between the summer of 2006 and June 2007, the 47 percent spike in the projected construction cost of Wisconsin Power & Light's now-cancelled Nelson Dewey 3 coal plant between February 2006 and September 2008, and the near-tripling of the estimated cost of AMP-Ohio's proposed Meigs County Coal Plant between October 2005 and October 2008.[4]

As the Commission is aware, SCE&G plans to build two new nuclear units at the site of the V.C. Summer Nuclear Station; as of February 2009, the Company reported that the "projected cost to build the two units is $9.8 billion; SCE&G's share of that total is $5.4 billion."[5] Nuclear plants are not immune from this trend of cost increases, however. For example, according to one recent news report, a Canadian Energy and Infrastructure Minister announced in late June that he was suspending a competitive process for the purchase of two new 1200-megawatt reactors for Ontario, citing the $26

[4] David Schlissel and Lucy Johnston, *Preliminary Assessment of East Kentucky Power Cooperative's 2009 Resource Plan*, June 2009, p. 15. Available at http://www.synapse-energy.com/Downloads/SynapseReport.2009-06.0.East-Kentucky-Power-Cooperative-Assessment.09-012.pdf. For power plant cost increases up to 2007, see The Brattle Group, *Rising Utility Construction Costs: Sources and Impacts*, September 2007, page 31. ("Construction costs for electric utility investments have risen sharply over the past several years, due to factors beyond the industry's control. . . . These higher costs show no immediate signs of abating.").

[5] SCE&G, "SCE&G's New Nuclear Plans Approved by Public Service Commission of South Carolina," 2/11/09. Available at http://www.sceg.com/en/news-room/current-news/sceg-new-nuclear-plans-approved-by-psc.htm.

billion price tag as "'billions' too high."[6] Cost overruns have been frequent in past nuclear power plant projects.

In addition to their cost advantage, energy efficiency programs have more flexibility and less planning risk than do large generation projects. Making financial commitments to a large baseload plant eight to 10 years before any benefits are possible makes the prospect of such cost increases even more of a concern of ratepayers and severely impairs managerial and strategic flexibility for a utility. Few, if any, industries without captive customers would tolerate the possibility of a 10 to 20 billion dollar investment turning into a liability with little warning.

Q. Overall, how does DSM stack up against generation alternatives?

A. DSM is "hands down" the cheapest way to provide for energy needs right now and for the foreseeable future. The most responsible way for the utilities to spend the ratepayers' money is spend it on DSM, not new plants.

The U.S. EPA sums up the situation nicely in the following quote from its web site:

> ***Some Say:***
>
> Customers will pay more if utilities offer energy efficiency.
>
> **The Fact Is:**
>
> - Total bills can decrease 2% to 9% over a 10-year period.

[6] Tyler Hamilton, "$26B cost killed nuclear bid: Ontario ditched plan over high price tag that would wipe out 20-year budget," *Toronto Star*, July 14, 2009. Available at http://www.thestar.com/Business/article/665644.

- Customer will pay more if new, more costly infrastructure is built to serve avoidable demand.
- Lower demand from efficiency programs puts downward pressure on market prices.[7]

Q. Are you familiar with a recent study that demonstrates this point?

A. Yes. In December, 2007, McKinsey & Co. published a report on the costs of various measures for reducing greenhouse gas emissions in the U.S., which shows the vast amount of emission reduction available in the U.S. from energy efficiency programs at costs that are not only less than any generation alternative, but *that are less than the cost of doing nothing at all*. (That means those measures *save* more than they *cost*.)[8]

Q. Do DSM programs benefit only customers who participate in them?

A. Absolutely not. DSM is a resource that provides system-wide benefits to all rate classes in addition to any benefits it provides to program participants. DSM measures and programs deliver broad, system-wide benefits through reduced external costs, reduced market clearing prices for electricity, ancillary services and natural gas, and, perhaps most importantly, reduced capital costs and financial risks, which are inherent in any construction of new generation or transmission and distribution ("T&D") facilities.

In other words, while DSM program participants save on their individual energy bills each month, the reduction in need for new capacity and associated costs savings to all customers are system-wide benefits. The accompanying reduction in financial,

[7] *See*, U.S. EPA at http://www.epa.gov/cleanenergy/energy-programs/napee/index.html.
[8] Jon Creyts, et al., *Reducing Greenhouse Gas Emissions: How Much at What Cost?* Exhibit B on page xiii. Available at http://www.mckinsey.com/clientservice/ccsi/pdf/US_ghg_final_report.pdf

regulatory and operational risks from DSM benefit all ratepayers, as well, through less volatile rates and lower the cost of capital that can accrue to utilities that avoid those risks.

Q. You have referred to the risk-avoidance benefits of utility DSM programs. Can you explain those benefits?

A. Unlike new power plants or T&D facilities, DSM programs offer immense risk reduction benefits for ratepayers and utility stockholders alike, when compared to supply-side resources. For example, energy efficiency, which generally has zero sensitivity to fuel costs, can help reduce the risks associated with fossil fuels and their inherently unstable price and supply characteristics.

Energy efficiency can also reduce risk by reducing a utility's environmental impacts and helping utilities and their ratepayers avoid the hard-to-predict costs of complying with potential future environmental regulations, such as carbon dioxide regulation.[9] Of course, energy efficiency also reduces the regulatory, liability and other risks associated with other environmental and health effects, such as those from mercury and other hazardous air pollutants, as well as the risks to South Carolina's economy from potential ozone non-attainment problems. Energy efficiency can improve the overall reliability of the electricity system by reducing peak demand at those times when reliability is most at risk and by slowing the rate of growth of electricity peak and energy demands and giving utilities more time and flexibility to respond to changing market

[9] The U.S. EIA *Annual Energy Outlook* for 2009 and, as mentioned therein, issuances by Citibank, JPMorgan Chase, and Morgan Stanley all express new or increased concern over the impact of CO_2 regulation on the industry. Available at http://www.eia.doe.gov/oiaf/aeo/pdf/0383(2009).pdf

conditions, while moderating the "boom-and-bust" effect of competitive market forces on generation supply.[10]

Q. Are there other reasons why energy efficiency is less risky than supply-side alternatives?

A. Yes. Unlike supply-side alternatives, DSM programs are modular, quick to deploy and easily adjustable as circumstances change. Additionally, each measure installed delivers immediate benefits, unlike a power plant that delivers no benefits unless and until it is completely built and in service. Uncertainties in load forecasts, capital costs of new generation, and permitting delays are examples of the types of planning risk that burden supply-side options but not DSM resources.

Utility representatives often make much of the supposed riskiness of DSM investments compared to generation investments, such as lack of certainty as to the amount of DSM they can actually harvest. However, they typically make no effort to compare those uncertainties to the many risks, financial and otherwise, that generation alternatives carry with them.[11]

The important point here is that any difficulties that arise in DSM program delivery can be identified, addressed and remedied in as little as one calendar quarter,

[10] Steven Nadel, Fred Gordon and Chris Neme, *Using Targeted Energy Efficiency Programs to Reduce Peak Electrical Demand and Address Electric System Reliability Problems*: ACEEE 2000, http://www.aceee.org/pubs/u008.htm; Regulatory Assistance Project, *Efficient Reliability: The Critical Role of Demand-Side Resources in Power Systems and Markets*, prepared for the National Association of Regulatory Utility Commissioners, June 2001. Available at http://www.raponline.org/pubs/general/effreli.pdf.

[11] For example, SCG&E witness Wilson discusses the supposed risks of DSM at length beginning on page 5 of his prefiled direct testimony. In the main, his fears for risk from DSM programs appear to center around uncertainties that investors would see recovery of direct program costs and the risk of earnings erosion due to lost margins. However, he, himself, states that those risks are covered by the Company's proposal. Wilson prefiled Direct at 9, lines 8–11 ("A proper implementation of these provisions will allow SCE&G to maintain its financial position and continue to attract equity and debt capital on reasonable terms while implementing DSM programs that reduce energy sales and demand.") The only risk he points out for assets other than DSM is the risk around cost recovery.

while a problem that crops up in the construction or operation of a new, large-scale fossil fueled or nuclear power plant can take a decade or more to surface and may be irremediable once identified.

Q. How should the Commission reflect DSM's risk avoidance benefits in DSM policy?

A. I recommend doing so via certain adjustments to the cost-benefit test used by the Company in screening the cost-effectiveness of its DSM programs and measures. There are three such adjustments that I recommend.

The first is to reflect DSM's avoidance of carbon cost risk by including carbon costs in the avoided cost of energy and capacity to be used in design, field screening and evaluation of utility energy efficiency programs and in goal setting. Methods for monetizing carbon costs are in flux, but a value of zero is clearly wrong. This adjustment would increase the avoided costs used in the total resource cost ("TRC") test and make somewhat more DSM programs cost-effective.

The second is to reflect the environmental risk of supply-side resources (other than avoided power costs), such as land use impacts, via an adjustment of +10% to the avoided cost of transmission and distribution, reserves and ancillary services. This adjustment would also increase the avoided costs used in the TRC test and make somewhat more DSM programs cost-effective.

I recommend that the Commission direct that these first two adjustments be applied in addition to the other quantifiable benefits from DSM, and that they be used when calculating TRC values for specific DSM measures and programs in both program design and field screening, as well as for goal setting, for program evaluation and for

evaluating the cost effectiveness of the overall portfolio of a utility's DSM programs. This is comparable to the way external costs of supply-side resources are recognized, for example, in Vermont.[12]

Third, I recommend reflecting the remaining risk avoidance benefits of DSM compared to supply-side resources via a 10% reduction in the cost of DSM measures and programs in the TRC calculation. As with the above adjustments, I recommend that the Commission direct that this third adjustment be applied as a reduction to the sum of the costs of DSM, and that it be used when calculating TRC values for specific DSM measures and programs in both program design and field screening, as well as for goal setting, for program evaluation and for evaluating the cost-effectiveness of the overall portfolio of a utility's DSM programs. Unlike the first two recommended adjustments, this adjustment would not change the avoided costs used in the TRC test, but would lower the cost of the DSM measures for the purpose of that test; however, it would also make somewhat more DSM cost-effective.

Q. Please explain the basis for recommending a 10% reduction to DSM program and measure costs in the TRC test to represent non-energy benefits of DSM in measure and program screening and evaluation.

A. In light of the risk reduction benefits of DSM programs, I consider a 10% downward adjustment to DSM costs a reasonable proxy for the value of avoiding the cost

[12] This percentage adder approach to factoring environmental costs into resource evaluation was widely used in the 1990s and usually applied equally to avoided costs of generation and T&D. See, for example, Vt. Public Service Board Final Order in Docket 5270, 1990; S. Stoft, J. Eto and S. Kito, *DSM Shareholder Incentives: Current Designs and Economic Theory*, Lawrence Berkeley Laboratories, 1995. More recently in the western states, the emphasis for generation externalities has been on pricing carbon emissions, but the percentage adder approach remains valid for non-generation avoided costs that impose external costs on society in areas of land use, habitat intrusion, scenic and tourism effect, and so on, as well as the costs of unanticipated increases in future fuel prices.

of those risks.[13] Ten percent is a commonly used contingency reserve for major construction projects and, so, is a reasonable proxy for at least one of the many risks borne by supply-side resources and not by DSM programs. (Some generation-related projects, such as nuclear decommissioning projects are planned with contingency factors of 25% or more.)

Q. Do DSM programs promote economic development?

A. Absolutely. DSM programs promote sound economic development for several reasons. One of the most obvious is the fact that cost-effective DSM programs reduce customer bills, freeing up funds for other expenditures. Lower and more predictable electric bills make businesses more competitive, protecting jobs. DSM programs also create a substantial net number of new jobs, both directly, through the delivery of programs, and indirectly, by creating a greater need for goods and services than traditional generation. To the extent that South Carolina's economic vitality depends on the State's ability to attract businesses and population to a healthy and clean environment, DSM activity can help.

Q. Are there any studies showing that DSM benefits the economy?

A. Yes. For example, a recent study of South Carolina's energy efficiency potential by the American Council for an Energy-Efficient Economy ("ACEEE") concluded that, "these efficiency policies and programs [a package of energy efficiency and water conservation policies, primarily utility DSM] can cut the net annual electricity and water

[13] There are various other ways of treating these risk reduction benefits in resource selection. To minimize the regulatory burden, I have proposed the simplest of those: application of a percentage discount to the cost of DSM. That is the approach utilized in Vermont since 1990. Vt. PSB Final Order in Docket 5270.

bills for customers by $9 million in 2015. . . . by 2025 net cumulative savings on electricity bills will reach $5.1 billion." Further, the study found that "Investments in efficiency policies and programs can also help create almost 22,000 new, local jobs in South Carolina by 2025 . . ., including well-paying trade and professional jobs needed to design, install, and operate energy efficiency measures. These new jobs, including both direct and indirect employment effects, would be equivalent to 175 new manufacturing facilities locating to the state."[14]

Another study estimated the economic impacts of the DSM and renewable generation policies of the New England states during calendar years 2000 through 2004. The study showed that a six-state investment of about $1.2 billion in energy efficiency programs (with an average cost of 2.4 cents/kilowatt-hour saved despite ten prior years of intensive DSM programs) resulted in a net increase in the region's economic output of about $2 Billion (in 2001 dollars), a net increase in income to workers of $694 million (2001$), and a net increase in employment of nearly 15,000 job-years.[15] Similar results have been found in numerous other studies around the country.[16]

[14] ACEEE, et al., *South Carolina's Energy Future*, November 2009. Available at http://aceee.org.

[15] Richard Sedano, et al., *Electric Energy Efficiency And Renewable Energy In New England: An Assessment of Existing Policies and Prospects for the Future*, The Regulatory Assistance Project, May 2005. The economic impact information is in App. C to that report—William Steinhurst, et al., *Modeling Economic and Environmental Effects of Investments in Energy Efficiency and Renewable Energy*, Synapse Energy Economics. Available at http://www.synapse-energy.com/Downloads/SynapseReport.2005-05.RAP-EPA.Efficiency-and-Renewable-Energy-in-New-England.04-23.pdf.

[16] For example, Marshall Goldberg, Martin Kushler, Steven Nadel, Skip Laitner, Neal Elliott, and Martin Thomas, *Energy Efficiency and Economic Development in Illinois*, ACEEE, December, 1998; U.S. DOE, *The Jobs Connection: Energy Use and Local Economic Development*, Nov. 1996.

Q. What do you conclude regarding the potential impact of electric utility demand-side management programs on economic development?

A. It is clear that aggressive, well-funded utility DSM programs based on sound least cost planning principles promote a vital state economy—much more so than equivalent investment in generation or T&D.[17]

Ensuring that aggressive DSM targets are set and vigorously overseeing their prompt pursuit is the best thing the Commission can do for the South Carolina economy at this time.

3. SCE&G'S PROPOSED DSM COST RECOVERY MECHANISM AND CLASS COST ALLOCATION

Q. Please describe the Company's cost recovery and incentive proposal.

A. SCE&G is requesting to recover program costs amortized over five years, lost revenues incurred between each general rate case, and its cost of capital on its unrecovered DSM balance, including a 3% incentive on its cost of equity.

[17] For further examples showing similar results, see *2002 Energy Efficiency Activities: A Report by the Division of Energy Resources*. Available at http://www.mass.gov/Eoeea/docs/doer/electric_deregulation/ee02-long.pdf. The studies cited in that report were: Weisbrod, Glen, Hagler Bailly Consulting Inc, et al, *Final Report: The Economic Impact of Energy Efficiency Programs and Renewable Power for Iowa*, Prepared for the Iowa Department of Natural Resources, December 1995; Goldberg, Marshall et al, *Energy Efficiency and Economic Development in Illinois*, American Council for an Energy-Efficient Economy (ACEEE), December 1998; and Nadel, Steven et al, *Energy Efficiency and Economic Development in New York*, New Jersey and Pennsylvania, ACEEE, February 1997. More recent studies with comparable results include Ian Goodman, *National Grid's Energy Efficiency Programs: Benefits for Rhode Island's Economic Development and Environment*, prepared for National Grid USA, July 2006 (available at http://www.thegoodman.com/pdf/081010033713_TGG20060728_NGridRI_Jobs.pdf); Lisa Petraglia, Glen Weisbrod and Brian Baird, *Economic Development Benefits: FY07 Economic Impacts Report*, February 2007, prepared for the Wisconsin Department of Administration (available at http://www.focusonenergy.com/data/common/dmsFiles/E_EC_RPTI_Econ_Dev_Benefits_FY07.pdf); and Howard Geller and Marshall Goldberg, *Energy Efficiency and Job Creation in Colorado*, April 2009 (available at http://www.swenergy.org/pubs/EE_and_Jobs_Creation_in_Colorado-April_2009.pdf).

Q. Does South Carolina law provide guiding principles for cost recovery and incentives to encourage energy efficiency?

A. Yes. S.C. Code 58-37-20 authorizes the Commission to adopt procedures to encourage electrical utilities to invest in cost-effective energy efficient technologies and energy conservation programs. If adopted, these procedures must:

(1) "*provide incentives and cost recovery* for energy suppliers and distributors who invest in energy supply and end-use technologies that are cost-effective, environmentally acceptable, and reduce energy consumption or demand";

(2) "allow energy suppliers and distributors to *recover costs* and *obtain a reasonable rate of return on their investment in qualified demand-side management programs sufficient to make these programs at least as financially attractive as construction of new generating facilities"*;

(3) require the Public Service Commission to *establish rates and charges that ensure that the net income of an electrical or gas utility regulated by the commission after implementation of specific cost-effective energy conservation measures is at least as high as the net income would have been if the energy conservation measures had not been implemented*.

(Emphases added).

Q. Do you believe that the Company's proposal is consistent with these principles and with sound regulatory policy?

A. No, I do not. Although the basic structure proposed by the Company is sound, there are certain flaws, and it should not be approved as proposed by the Company.

Q. Do you support the Company's proposed DSM cost recovery mechanism?

A. In part, yes. The Company's proposed "book and defer accounting" approach to DSM cost recovery is reasonable. It ensures recovery of those costs without creating a risk of over- or under-recovery. The proposed five-year amortization period is also reasonable. Although a longer period would lower annual collection amounts and, perhaps, more closely match the recovery period with the lifetime of some efficiency savings, it would also increase the total cost of saved energy by increasing financing and income tax expense and would increase any impacts on the Company's balance sheet. On the other hand, a much shorter amortization period would tend to create a mismatch between the life of efficiency resources and the period of their cost recovery. A five-year amortization period is a reasonable compromise between the benefits of a longer period and a shorter one.

Q. Are there aspects of the Company's proposed mechanism that you do not support?

A. Yes, there are two. The proposed cost allocation mechanism is not specific enough to meet normal regulatory standards, and it inappropriately allocates DSM costs among the customer classes.

Q. Please explain why the Company's proposed cost allocation method is not specific enough to meet normal regulatory standards.

A. To begin with, Company witness Kenneth Jackson testified that "SCE&G will track participation in DSM programs by customer class" and "SCE&G will assign direct DSM program costs and lost net margin revenue" Exh. KRJ-1 at 4. However, the manner in which SCE&G will do so is unclear. Tracking "participation" could mean tracking

participating customer counts, estimated saved energy (with or without post-period true-ups), estimated capacity savings, dollars spent in a given class, some combination thereof, or something else altogether. Under normal regulatory standards, tariffs (and riders on tariffs) must be clear enough so that customers and regulators know what retail rates are or how they will be calculated.

Q. Please explain how the Company's proposed cost allocation method inappropriately allocates DSM costs among customer classes.

A. The Company's proposed cost allocation method ignores the critical fact that DSM delivers system-wide benefits that are enjoyed by all customers in proportion to their power use, just as the system-wide costs of new generation are borne by all customers in proportion to their power use. Accordingly, class cost allocation should be conducted in a manner similar to that used for other resources acquired to serve load.

Q. What is your recommendation for a just and reasonable cost allocation method?

A. I recommend allocating utility DSM program costs among all rate classes. The specific class allocators could be determined in various ways. I have not reviewed the Commission's specific rate design practices, but, as mentioned above, DSM is a resource that provides system-wide benefits. In other words, while program participants see a benefit on their bills, DSM measures reduce the utility's need for new capacity, the costs of which are recovered from all customers. For that reason alone, it is appropriate to allocate DSM program costs among all rate classes. In addition, the financial, regulatory and operational risks described above are reduced for the same reasons and the total cost

of service is less dependent on volatile fuel prices. These benefits also accrue to all ratepayers.

The specific choice of an allocation factor will depend upon the type of the system-wide benefits, in a manner equivalent to the allocation of supply resource costs on the basis of "cost causation." The choices of allocation factors according to classification of system-wide benefits should include the following:

1. Costs for programs that produce energy-related benefits should be allocated using an "energy" allocation factor (e.g. annual kilowatt-hours by rate class)
2. Costs for programs that produce capacity-related benefits should be allocated using a "capacity" allocation factor (e.g. kilowatts of coincident peak by rate class)
3. Costs for programs that produce a combination of energy and capacity benefits consistent with average annual supply costs should be allocated using an annual supply cost allocation factor (e.g. annual supply costs by rate class).

Q. Are there costs that should not be recovered through the Company's proposed mechanism?

A. Yes. I recommend that the Commission exclude from recovery under the proposed mechanism any advertising and promotion expenses to the extent that the costs are for corporate image advertising or the like, and not purely for promotion of participation in specific DSM programs. Such expenses are not a necessary part of a cost-effective program. This policy would help to ensure the credibility and cost-effectiveness of utility DSM programs.

4. NET LOST REVENUE RECOVERY MECHANISM

Q. What is net lost revenue and why should the Commission address it?

A. Recovery of lost revenue arises as a ratemaking issue because DSM reduces retail electricity sales.[18] In most circumstances, once a retail rate is set, the utility recovers a portion of its fixed costs through each kilowatt ("kW") or kilowatt-hour ("kWh") sold. Conversely, the utility foregoes recovery of fixed costs with each kW or kWh not sold. This creates the so-called "throughput incentive" for the utility to sell more kW and kWh, and to avoid anything that will reduce its volume of sales. Thus it is important to address lost revenue if the Commission wishes to obtain significant DSM savings

Q. Do you support the Company's proposed net lost revenue mechanism?

A. The proposed mechanism is reasonable in its basic intent, but has certain shortcomings and should not be approved unless they are remedied.

Q. Please explain.

A. The definition of Margin Revenue appears to overstate the magnitude of lost revenue to the Company due to DSM savings. This is because, as set out in the proposal, the calculation of Margin Revenue omits any correction for off-system sales, sales for resale, reduced purchases of energy and capacity or transmission by others, or other reduced expenses. Even if the mechanism did account for such offsets, its "year ahead" approach requires a true-up, and the proposal states that it will true up Margin Revenue only for errors in forecasting program participation rates. Exh. KRJ-1 at 2.

[18] W. Steinhurst, *Electricity at a Glance*, NRRI, Nov. 2008, p. 26. Available at nrri.org/pubs/electricity/electricity_at_a_glance.pdf. Generally, the resulting "throughput incentive" applies most to energy efficiency programs, but little or not at all to demand response programs, which do not normally create lost revenue effects.

Q. Do DSM programs require measurement and verification of costs and savings?

A. Yes, they do. DSM programs require specialized monitoring, verification, and evaluation (MV&E) for several reasons. Good MV&E is needed to ensure (1) sound design and delivery of programs, including continuous improvement, (2) accurate determination of lost revenue adjustments, (3) accurate administration of any utility incentive mechanism, and (4) support for program cost recovery.[19] Due to the variety of measures and programs, these activities are more complex than supply-side measures. Regulators should pay attention to process evaluation, i.e., an assessment of how programs function and may be improved, early during implementation and at intervals thereafter. Ongoing monitoring systems, including a tracking database, are needed, as well as validation of recorded costs and savings. Impact evaluation should be done regularly, including assessment of how programs have affected market practices in construction and purchasing. Some states require evaluation by an independent party.[20]

Q. Does the Company's proposed mechanism include adequate measurement and verification of savings?

A. I can find no description of the Company's measurement and verification for custom programs (i.e., DSM programs that provide customized installations) or any measures not already included in the "then-current" Measures Database. (If Company intends to exclude from program design and implementation any measures not in the Measures Database, this is an incorrect policy.) The proposal compounds this lack of clarity by stating that it may rely on "such successor data source as the Company may

[19] The systems and data collection needed for MV&E can also provide crucial tracking and other management information in support of DSM program administration.
[20] W. Steinhurst, op. cit., p. 26.

reasonably designate, supplemented as required where data not found in the database is needed to make the necessary calculations." There is no commitment to update the Measures Database or validate its applicability. Also, there is little, if any, explanation of how DSM program participation will be projected (for a given year) and how it will be "tracked" and applied for purposes of true-ups. Basic accountability, as well as the credibility of utility DSM programs, requires a more reliable foundation for measurement and verification of savings.

Q. What do you recommend with regard to lost revenue recovery?

A. I recommend the Commission approve the Company's proposed net lost revenue recovery mechanism with several critical modifications. For the proposed rider to be just and reasonable, it should be modified to (1) correct for off-system sales, sales for resale, reduced purchases of energy and capacity or transmission by others, and all other reduced expenses; (2) require adequate evaluation, measurement and verification of both DSM savings and the offsets mentioned in the previous item; and (3) require true-up for actual savings and offsets, not just for errors in forecasting program participation rates.

5. UTILITY INCENTIVE MECHANISM

Q. What is meant by utility incentives?

A. Some states, including South Carolina, have determined that utilities should receive an incentive for investing in DSM, over and above recovery of costs and lost revenues. Utility incentives can be fashioned in a number of ways, such as (1) a share of the saved power costs, (2) a share of the DSM budget, (3) a bonus return on equity (either generally or only on investments in DSM), or (4) a set dollar amount. Any of these

methods may be subject to adjustment based on a sliding scale that reflects progress against savings goals or other performance measures.

Q. What is the purpose of utility incentives and why should the Commission address them?

A. The most basic purpose of such incentives is to promote delivery of maximum amounts of cost-effective energy and capacity savings. Incentives can also be used to promote achievement of specific goals, such as achievement in a specific hard-to-reach market segment or meeting certain implementation deadlines. If the Commission wishes to promote exemplary achievement in DSM program design and delivery and, perhaps, other particular goals, it should consider an incentive mechanism that rewards the Company for delivering those outcomes.[21] Incentives can also be used as part of a package of ratemaking mechanisms to make DSM the most "profitable" resource choice. This incentive method is given support by the language of S.C. Code 58-37-20.

Q. Please describe the Company's proposed utility incentive mechanism.

A. SCE&G is asking for an adder of 3% to the equity component of its cost of capital as applied to the unrecovered costs of its proposed new DSM programs.

Q. Is this type of incentive structure reasonable?

A. Yes. A Return on Equity ("ROE") adder can be an effective utility incentive mechanism.

[21] It is important to keep in mind the distinction between utility incentives as discussed here and the participation incentives (e.g., rebates) that utilities *pay* to program participants in some programs. The word "incentive" is commonly used for both mechanisms, and its meaning must be clarified by the context.

Q. Do you support the Company's proposed 3% ROE adder?

A. No. The Company's proposed 3% ROE adder is excessive and unwarranted given the DSM savings "goals" and program design principles set out by the Company. Howard prefiled at 7. The Company proposes annual DSM savings of only about 0.7% by the third year of the plan, even though, as explained by SELC and SCCCL witness Lyle, the potential is much higher, and leading utilities have delivered and proposed much larger annual savings. The low magnitude of DSM savings proposed by Company initially is exacerbated by several factors, including:

1. Negligible ramp up in proposed savings year-over-year,
2. Lack of any proposed savings or commitment past three years (which is very important to successful program delivery as explained by SELC and SCCCL witness Lyle)
3. Absence of any binding goals or targets to drive management and the Company's resistance to setting any such goals or targets
4. Use of program design principles that are not designed to identify and achieve all cost-effective savings available (e.g., commitment to avoid non-cost-effective investments but no commitment to seek out all such investments) or are vague ("balanced portfolio")
5. Lack of targeted DSM programs for hard-to-reach customers.

Q. Do you have any other concerns regarding the proposed utility incentive mechanism?

A. Yes, I do. The utility incentive mechanism should be tied to performance, not just to program expenditures. Without a "pay for performance" component, a cost-plus incentive will create incentives to spend money, but not to save energy. It is also unreasonable to allow the Company to accrue incentive payments on a projected participation basis, even if there is a later true-up. This flaw is only compounded by concerns about the nature and extent of the Company's proposed measurement, verification and evaluation of savings delivered by DSM programs, as discussed above.

Q. What utility incentive structure do you recommend to the Commission?

A. I recommend the following utility incentive structure.

1. Annual DSM energy savings targets should be established.
2. The Commission should establish a Base ROE Incentive to be applied if an annual target is met, plus a range of positive and negative adjustments to that ROE incentive to be applied when actual savings differ from the annual target.[22]
3. At the end of each year, the Company's DSM savings performance should be reviewed against the pre-established savings targets to determine the incentive adder that will be applied to the default incentive return factor for the prior year's outlays.

[22] The Commission may wish establish a "dead band" around the target, which is a range of savings around the annual target within which the Base ROE incentive would not change.

4. If the Company's DSM savings performance falls below its target, the Base ROE Incentive would be reduced as set out in item 2. If the Company's DSM savings performance rises above the target, the Base ROE Incentive adder would be set in the positive part of the Commission's range.
5. Once the incentive adder has been determined in this manner for a given year's DSM outlays, the Company would true up its ROE recovery to date for that year's expenditures and continue to apply that incentive adder for the rest of that year's amortization period.
6. The Company's receipt of full incentives should be conditioned on compliance with certain minimum standards for program design, delivery and scope.

Q. What specific Base ROE Incentive and adjustments do you recommend?

A. Yes. I propose that the Commission set the Base ROE Incentive at 1% or 100 basis points. In my experience a 100 basis point change to ROE is highly effective at motivating utility performance. I also propose the Commission adopt a tiered system of adjustments to the Base ROE Incentive as follows:

Utility Performance	**ROE Incentive Adjustment**	**Effective ROE Incentive (To be added to current allowed ROE)**
Below 50% of target	-3%	-2%
Between 50% and 75% of target	-2%	-1%
Between 75% and 90% of target	-1%	0%
Between 90% and 110% of target	0%	+1%
Between 110% and 125% of target	+1%	+2%
Between 125% and 150% of target	+2%	+3%
Above 150% of target	+3%	+4%

Q. Has this approach been shown to work in other jurisdictions?

A. Yes. Several of the most highly regarded energy efficiency programs provide for performance-based utility incentives. For example, the Vermont efficiency utility receives a portion of its compensation on the basis of savings delivered and meeting other priority goals. Connecticut utilities also received incentives based on reaching established performance targets. Also, as of 2008, 19 states employed such utility incentives.[23]

Q. Why should the Commission adopt your recommendation?

A. It is a truism in management that "you get what you measure."[24] What this really means is "you get what you measure and pay for." Utility incentives should reward savings, not expenditure of money. Failure to link "pay" and "performance" could lead

[23] ACEEE, *The 2008 State Energy Efficiency Scorecard*, Oct. 2008. Available at http://aceee.org/getfile.cfm?publicationid=108. ACEEE defines performance incentives as "financial incentives that reward utilities . . . for reaching or exceeding program goals." (page 16).

[24] See, for example, *Expect More*, The Council for Excellence in Government, available at http://www.whitehouse.gov/omb/expectmore/Council_for_Excellence_in_Government_ExpectMore_Booklet.pdf

to customers paying more than necessary for power and to paying an excessive price for energy efficiency savings. Therefore, it should not simply reward the spending of money on DSM as proposed by the Company. Instead, it should see to it that aggressive targets are established; see that performance (including costs and benefits) are properly evaluated, measured and verified; and make utility incentives depend heavily on performance against those targets. While it can be convenient to set a baseline incentive in the form of a bonus ROE on booked and deferred DSM outlays, that alone could raise a number of serious concerns about the DSM programs that would result. To avoid such concerns, I recommend that the Commission include a strong performance component of the type I recommended above in any utility incentive it may order.

Q. Please explain those concerns that require a performance-based component as part of any utility incentive mechanism.

A. Certainly. First, as is the case with both supply- and demand-side investments, basing an incentive on expenditures results in an incentive to inflate the cost of acquiring a resource. This is sometimes known as "gold plating." The provision of an ROE incentive on program costs creates a degree of incentive for such outlays. However, that is no reason to reinforce the incentive for gold plating by adding further incentives based on the amount of money spent on programs.

Second, unless the savings actually delivered drive incentives, the utility is under no pressure to deliver any more DSM savings than are necessary to escape regulatory scrutiny. Utilities need a positive incentive to maximize cost-effective and comprehensive savings. The lack of such a performance-based incentive may result in

"cream skimming," such installing only the cheapest efficiency measures, even though additional, higher-cost measures would be cost effective, or the creation of "lost opportunities," such as occur when efficiency measures are not installed when it is most cost-effective to do so, *e.g.*, the construction of a new building or facility, building renovations, and the purchase of new appliances or equipment).

Third, utility DSM programs should be designed and implemented so as to obtain savings wherever they are, regardless of customer type, rate class or geography.[25] Sometimes, utility DSM programs omit certain "hard-to-reach" customer types because they are inconvenient or can be reached only by specialized programs variations.

These three issues are important and relevant here because they bear on the proper conditions for utility incentives and because they are critical to helping the Commission "ensure that demand side options are pursued wherever economically and environmentally practical" and "ensure that short term energy decisions do not conflict with long range energy needs."[26]

Q. Please explain the terms "lost opportunities" and "cream skimming" and tell us why they are important.

A. Utility energy efficiency programs, as for any other utility expenditure or investment, should be prudently managed and deliver least cost service. Two important policies are necessary to ensure that outcome.

[25] It can, however, be appropriate to prioritize locations or customer types that are located so as to offer the opportunity to avoid or resolve T&D constraints or that offer extra peak-hour savings benefits, both to the extent that the extra costs avoided warrant such priorities.
[26] S. C. Code 48-52-210.

First, utility energy efficiency programs should be designed and implemented to minimize "lost opportunities." Lost opportunities occur when efficiency measures are not installed when it is most cost-effective to do so (e.g., the construction of a new building or facility, building renovations, and the purchase of new appliances or equipment). In the case of new construction DSM, for instance, there is a window of time within which it is cheap and easy to upgrade the efficiency of a building that will be an electricity-consuming structure for twenty, forty or more years. One reason this is the case is that upgrading the efficiency of a building component at the time of design is usually much less expensive than doing so after the structure is built. Doubling the R-value of the shell, for example, requires the use of better insulation and, perhaps, wider studs and the like—relatively low cost items. Getting the same level of improvement later would be a major undertaking in most cases and much more expensive.

Second, programs should be designed and implemented to minimize "cream skimming." Cream skimming occurs when only the most cost-effective efficiency measures are installed, even though additional, higher-cost measures would be cost effective. Cream skimming can lead to lost opportunities, because revisiting a customer to install the remaining measures may involve prohibitive transaction costs. One example of this is arbitrarily limiting the number of efficient light bulbs made available to a customer during a home energy audit. Most of the cost of such an audit is made up of marketing, recruiting and qualifying participants, "rolling the truck" to get the auditor to the premise, and the related paperwork and follow up. Once that cost has been incurred it is unlikely that it would be justified to repeat it, at least not for a number of years.

Therefore, any DSM measures not installed at the time of the audit through cream skimming become lost opportunities. Cream skimming "poisons the well."

I bring this issue to the Commission's attention because, in my experience, program design and delivery by utilities often arbitrarily create lost opportunities or base their designs on cream skimming approaches. Some utilities in other jurisdictions have arbitrarily limited the number of compact fluorescent bulbs installed in a given residence, even if there are additional change outs that would have been cost-effective. Once the overhead has been spent to enroll a customer in an audit or custom measure program or otherwise, deliberately omitting any cost effective measure prevents least cost resource acquisition and is, therefore, imprudent management and should not earn any utility incentives. Lost opportunity programs (e.g., new construction programs) must be designed, approved and deployed as soon as possible, and then the utility can push for maximum market penetration of that measure. This is critical because if the utilities wait several years to implement these measures, critical opportunities will be lost.

I recommend the Commission take the precaution of explicitly requiring that utility energy efficiency programs be designed and delivered in a manner that prevents cream skimming or the creation of lost opportunities. I also recommend that the Commission require that utility energy efficiency programs (1) adhere to comprehensive approaches that improve energy efficiency of entire buildings or industrial processes, rather then just address single measures or technologies, and (2) include a full menu of services, including incentives, marketing, training, technical assistance, and education on

a number of end use applications (such as lighting, appliances, HVAC systems, and improvements to the building envelope).

Utility incentives should be conditioned on fully meeting these standards.

Q. Please explain the term "hard-to reach customer" and why it is important to utility incentives.

A. By "hard-to-reach customers," I mean:

1. Residential electricity users who rent their residences from persons other than relatives, trusts operated by and for the benefit of the users, or the users' legal guardians;
2. Commercial electricity users who rent their business property from persons other than the users' owners, parent companies, subsidiaries of their parent companies, their own subsidiaries, or trusts operated by and for the benefit of the same;
3. Residential or commercial electricity users who traditionally fail to engage in energy efficiency or demand response programs because of one or more severe barriers beyond those experienced by average residential or commercial customers in a utility's service area.

By "barrier," I mean any physical or non-physical necessity, obligation, condition, constraint, or requisite that obstructs or impedes electricity user participation in energy efficiency or demand response programs. Barriers may include but are not limited to language, physical or mental disability, educational attainment, utility meter type, economic status, property status, or geography.

The Company has made an inadequate commitment to DSM service for hard-to-reach customers (including but not limited to low- or limited-income customers, renters, mobile home residents, small businesses). I agree with the Company that it is appropriate to allow for higher incentives and lower benefit-cost ratios for such customers[27], but it is not appropriate to limit DSM service for them to the types of programs suitable for other customers. The Company's reason offered for that decision is an insufficient basis for failing to ensure that these customers are served equitably or for forgoing the DSM savings that would flow from doing so.

There are many, well-documented barriers that hard-to-reach customers face in the adoption of DSM measures.[28]

Equity demands proper treatment for hard-to-reach customers, including those on limited incomes, small businesses, and others. These customers face higher and added barriers both to implementing DSM on their own or to participating in DSM programs. Specifically, as a policy matter, the Commission should require that utility energy efficiency programs (or additional, special programs as needed) be designed and implemented so as to ensure that hard-to-reach customers' needs are met in ways the work for them, not just the average customer.

[27] Direct Testimony of Felicia Howard, page 7, line 7.
[28] Examples include: Ontario Power Authority, *A Low Income Energy Efficiency Program,* March 2006, p. 11, available at http://www.powerauthority.on.ca/Storage/67/6264_TEA_report.pdf; CA PUC, *D-0712051 Decision Providing Direction for Low-Income Energy Programs,* section 6, available at http://docs.cpuc.ca.gov/published/FINAL_DECISION/77082-05.htm.

Q. What policy do you recommend to the Commission in regard to utility energy efficiency programs for hard-to-reach customers?

A. The Commission should adopt policy guidelines to ensure that proper and equitable DSM service is delivered to hard-to-reach customers and that utility incentives are conditioned on complying with that requirement. The Commission should also require the Company to go back to drawing board to develop and implement programs that meet those guidelines, report them back for review and approval, and field them at the same time as its other programs.

For that guideline, I recommend that the Commission policy be that utilities are required to address programs for limited-income customers and other hard-to-reach customers so as to assure proportionate energy efficiency programs are deployed in these customer groups despite higher barriers to energy efficiency investments. The Commission may wish to allow programs targeted to low-income or hard-to-reach customers to meet lower threshold cost-effectiveness results than other programs or be enhanced in other ways to ensure that those customers are not left out.

Utility incentives should be conditioned on fully meeting these standards.

Q. Please explain why you make that recommendation.

A. In my experience, some utility program designs and implementation strategies indicate a lack of sensitivity to this requirement and lead me to spell out in some detail here the policy on hard-to-reach customers, which I recommend the Commission adopt and require utilities to use in their energy efficiency programs. The Commission should also establish goals that are based on potential studies not tainted with such errors.

Furthermore, South Carolina energy policy calls for actions that "ensure that basic energy needs of all citizens, including low income citizens, are met" as part of a "plan that maximizes to the extent practical environmental quality and energy conservation and efficiency, and minimizes the cost of energy throughout the State."[29] The policy I recommend here is intended to ensure that utilities do their part to deliver on that policy, independent of the ebb and flow of federal funds that may or may not become available.

Q. Please summarize the conditions you recommend as prerequisites for the utility to obtain the ROE incentives you propose.

A. I recommend that the Commission require that utility energy efficiency programs:

(1) adhere to comprehensive approaches that improve energy efficiency of entire buildings or industrial processes, rather then just address single measures or technologies, and

(2) include a full menu of services, including incentives, marketing, training, technical assistance, and education on a number of end use applications (such as lighting, appliances, HVAC systems, and improvements to the building envelope), and

(3) include programs and incentives as needed to ensure delivery of proportionate energy efficiency benefits in the premises of hard-to-reach customers.

Utility access to incentives should be conditioned on fully meeting these standards. These three issues are important and relevant here because they bear on the proper conditions

[29] S.C. Code Ann. § 48-52-210(B)(5) and (A), respectively.

for utility incentives and because they are critical to helping the Commission "ensure that demand side options are pursued wherever economically and environmentally practical" and "ensure that short term energy decisions do not conflict with long range energy needs."[30]

6. RECOMMENDATIONS

Q. Please summarize your recommendations to the Commission.

A. I recommend that the Commission:

1. Require the Company to reflect DSM's risk avoidance benefits via certain adjustments to the cost-benefit test used in screening the cost-effectiveness of its DSM programs and measures; specifically, inclusion of carbon costs in cost-benefit testing , an adder for the environmental impact risks of other supply-side resources, and a downward risk adjustment to the costs of DSM;
2. Require the Company to reflect the system-wide benefits of DSM by allocating utility DSM program costs among all rate classes in a manner equivalent to the allocation of supply resource costs on the basis of "cost causation";
3. Approve the Company's proposed DSM program cost recovery mechanism, but exclude from recovery under the proposed mechanism any advertising and promotion expenses to the extent that the costs are for corporate image advertising or the like, and not purely for promotion of participation in specific DSM programs;

[30] S. C. Code 48-52-210.

4. Approve the Company's proposed net lost revenue recovery mechanism with the following conditions: (1) corrections for off-system sales, sales for resale, reduced purchases of energy and capacity or transmission by others, and all other reduced expenses; (2) adequate evaluation, measurement and verification of both DSM savings and the offsets mentioned in the previous item; and (3) true-up of collections for actual savings and offsets, not just for errors in forecasting program participation rates;
5. Reject the Company's proposed utility incentive scheme and replace it with a performance-based method driven by verified delivered DSM savings against established targets and conditional on compliance with DSM program design and implementation standards recommended in this testimony, consistent with the model set out above;
6. Require that utility energy efficiency programs be designed and delivered in a comprehensive manner that prevents cream skimming or the creation of lost opportunities, and includes equitable DSM service to hard-to-reach customers, conditioning utility incentives on compliance with these requirements.

Q. Does this complete your testimony?

A. Yes, at this time.

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PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc., Cambridge, MA.
Senior Consultant, July 2003 to Present
Consulting services to state public advocates, consumer advocates, environmental organizations, and utility regulators on regulatory policy, power supply procurement, electric industry restructuring, portfolio management, rate setting and rate design, economic impacts of efficiency and renewable generation programs, and other utility and energy topics. Expert witness services and litigation advice. Co-authored reports, journal articles and conference presentations on portfolio management, energy efficiency programs, and electric reliability.

Vermont Department of Public Service, Montpelier, VT.
Director for Regulated Utility Planning, 1986-2003
Preparation of long range policy plans in the areas of electric utilities, energy and telecommunications, including oversight of research, modeling, public input processes, policy analysis and writing. Development of policy positions and drafting of legislation and rules concerning utility resource planning, power supply acquisition, generation and transmission permitting, environmental costing, energy efficiency and alternative generation, utility restructuring and retail choice, distributed utility planning, rate setting and rate design, mergers, financing and acquisitions, decision analysis, power contract restructuring, Qualifying Facility contracts and permits, net metering, and other critical regulatory issues. Extensive expert testimony on those matters, as well as utility bankruptcy, prudence reviews, and critical utility policy matters. Extensive legislative testimony.

Planning Econometrician, 1981-1986
Energy demand forecasting, economic and demographic projections, economic and policy impact analysis, avoided cost estimates, and other quantitative analysis for utility and energy policy making. Development of State's basic policies regarding least cost planning and resource selection, including methods for evaluation of and program design for generation, transmission and demand-side options. Implementation of utility energy efficiency program requirements.

Vermont Agency of Human Services, Montpelier, VT.
Director of Planning, 1979-1981

Vermont Department of Social and Rehabilitation Services, Waterbury, VT.
Director of Planning and Evaluation, 1977-1979
Acting Deputy Commissioner, 1977

Vermont Department of Corrections, Montpelier, VT.
Director of Planning and Research, 1974-1977
Chief of Research and Statistics, 1973-1974

Pre-2004 Energy Consulting

Illinois Energy Office, 1986.
Massachusetts Executive Office of Energy Resources, 1986.
Northern Technology, Inc., Gorham, NH, 1983-1985.

James River Corporation, Green Bay, WI, 1985.
Newfoundland Department of Natural Resources, 1995

Teaching

University of Vermont, Burlington, Vt., 1977 to 1989
Adelphi University, Garden City, N.Y., 1980 to 1988
University of N. H., Complex Systems Ctr., Grad. Studies Comm., 1992-1994
Institute of International Education, Least Cost Planning Seminar, 1999
Community College of Vermont, 2002-2004

Miscellaneous

National Science Foundation Undergraduate Research Grant, 1965.
Wesleyan University Astronomy Prize, 1967.
Association for Criminal Justice Research (Northeast/Canada), Director, 1973 to 1981, Secretary/Treas., 1973 to 1980.
University of Vermont Graduate Award in Statistics, May, 1980.
Contributing Editor, Current Index to Statistics, 1976-1985.
Chair, Session on Energy Economics, New England Business and Economics Association Annual Meeting, 1983.
Member, Intl. System Dynamics Soc., Tau Beta Pi.
Northeast International Committee on Energy, New England Governors' Conference/Eastern Canadian Premieres, various periods, 1986 to 2003
Director, Vermont Girl Scout Council, 1989-1991, 2000-2008; Secy., 1991-1997
3rd Vice President, Girl Scouts of the Green and White Mountains, 2009 to date
Editor, Intl. System Dynamics Soc. Bibliography, 1990-
Advisory Group Member, New England Project, MIT Analysis Group for Regional Electricity Alternatives, 1991-1995.
Chair, Steering Committee & Modeling Subcommittee, New England Governors Conf. Regional Energy Planning Project, 1991-1995.
Member, Montpelier School System Technology Steering Committee and Montpelier High School Technology Committee, 1992-1993.
Reviewer, Vermont Experimental Program to Stimulate Competitive Research, 1993-
Invited Speaker, 3rd Intl. Conf. on Externality Costs, Ladenburg, FDR, 1995.
Member, Steering Committee, New England Governors Conference, Restructuring/ Environmentally Sustainable Technologies Project, 1996-1997
U. S. DOE Distributed Generation Collaborative, 2000-2003
Justice of the Peace, Montpelier, Vermont, 2007–

EDUCATION

Degrees

B.A., Physics, Wesleyan University, Middletown, CT, 1970
M.S., Statistics, University of Vermont, Burlington, VT, 1980
Ph.D., Mechanical Engineering , University of Vermont, Burlington, VT, 1988

Continuing Education

Seminar in Electricity and Telecommunications Demand, 1981
Advanced Workshop in Regulation and Public Utility Economics, June, 1982 and June, 1983, Rutgers University
Transmission Reliability Assessment, Power Technologies, Inc., 1986
Regional Forecasting and Simulation Modeling, January, 1991, U. Massachusetts-Amherst

Other

Justice of the Peace, Montpelier VT, 2007-date

TESTIMONY and AFFIDAVITS

Vermont Public Service Board

On behalf of the Vermont Department of Public Service:

Docket 4661 - Green Mountain Power Rate Increase

Dockets 5009/5112 - Vt. Electric Coop. Rate Increase

Dockets 5108/5109 - Vt. Marble Co. Small Power Rate

Docket 5133 - Moretown Hydro Energy Co. Small Power Rate

Docket 5202 - VPPSA Refinancing

Docket 5248 - DPS Ontario Hydro Power Purchase

Docket 5270 - Least Cost Planning and Demand-Side Management

Docket 5270-GMP-1 - Highgate Apartments Fuel Switching

Docket 5270-CV-1&3 - Demand-Side Management Preapproval and Ratemaking Principles

Docket 5270-CV-4 - IRP

Docket 5270-VGS-1 - Demand-Side Management Preapproval

Docket 5270-WEC-1 - Demand-Side Management Preapproval

Dockets 5270-BRTN-1, 5270-CUC-3, 5270-HDPK-1, 5270-JHNS-1, 5270-JKSN-1, 5270-LDLW-1, 5270-LYND-1, 5270-MRSV-1, 5270-ORLN-1, 5270-RDSB-1, 5270-ROCH-1, 5270-STOW-1, 5270-SWNT-1, 5270-VMC-1 - IRP's

Docket 5270-VGS-2 - Demand-Side Management Preapproval

Docket 5277 - DPS Ontario Hydro Transactions Agreement

Docket 5330A - Hydro Quebec Power Purchase

Docket 5330E - Hydro Quebec Power Purchase, Waiver and Amendment

Docket 5372 - CVPSC Rate Increase

Docket 5491 - CVPSC Rate Increase

Docket 5630/32 - VEC Debt Restructuring & Rate Increase

Docket 5634 - NET Toll Dialing Plan

Docket 5638 - CVPSC Mack Molding*

Docket 5664 - EPACT Standards

Docket 5810/11/12 - VEC Debt Restructuring & Rate Increase

Docket 5825 - Ludlow IRP - externalities

Docket 5826 - Vermont Marble Electric Division - IRP - externalities

Docket 5832 - Lyndonville IRP - externalities

Docket 5841/5859 - Citizens Utilities Prudence Review & Revocation Petition

Docket 5854 - Electric Restructuring*

Docket 5857 - GMP Rate Increase*

Docket 5971 - VEC Bankruptcy Reorganization*

Docket 5980 - Proposal for Statewide Efficiency Utility

Docket 5983 - GMP Rate Increase (HQ Issues)

Docket 6018 - CVPSC Rate Increase (HQ Issues)

Docket 6107 - GMP Rate Increase (HQ Issues)

Docket 6140 - Electric Industry Restructuring (various presentations)*

Docket 6033/6053/6110/6142/6158/6326/6327/6371/6462/6464 - various municipal electric rate increases* (HQ and Settlement Issues)

Docket 6270 - Qualifying facility contract reform

Docket 6290 - Distributed Generation*

Docket 6300 - Sale of Vermont Yankee

Docket 6330 - Petition of CVPSC and GMP on Restructuring (various presentations)*

Docket 6149/6315 - WEC electric rate increases* (HQ and Settlement Issues)

Docket 6460 - CVPSC Rate Increase (HQ Issues)

Docket 6495 - Vermont Gas Systems Rate Increase (Deferral Account and Hedging)

Docket 6565 - Various station service contracts

Docket 6596 - CUC rate Increase (HQ Issues)

Docket 6758 - Fourteen Utilities - Violations of Statutes on Special Contracts and Special Rates -- Phases I & II

For consulting clients:

Docket 6958 - Green Mountain Power Rate Design - for AARP

Docket 6958 - Green Mountain Power Rate Design - for Conservation Law Foundation

Docket 6958 - Green Mountain Power Rate Design - for Conservation Law Foundation

Docket 7085 – CVPS Street Lighting Tariff – for Village of Woodstock

Docket 7175 - Green Mountain Power Rate Design – for Conservation Law Foundation and AARP

Docket 7176 - Green Mountain Power Alternative Regulation Plan – for Conservation Law Foundation and AARP

Docket 7336 – CVPS Alternative Regulation Plan – for Conservation Law Foundation*

Docket 7466—Efficiency Utility Structure—for Conservation Law Foundation

Vermont State Environmental Board

Docket 5W0584-EB - Developers Diversified Land Use Permit

Federal Energy Regulatory Commission

Docket Nos. ER95-1586-000 and EL96-17-000 - Citizens Utilities Company **

California Public Utilities Commission

Multi-Stakeholder Study of Alternatives to the Mohave Generating Plant Pursuant to CPUC Decision 04-12-016 - for Southern California Edison (February 2006) *

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